DETAILED ACTION

1.   In acknowledgment of the amendments filed 20 April 2011, claims 1-89 are currently

pending.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

3.   Claims 1-11, 13-14, 17-36 and 38-50, 52-79, 83-84, 87-89 are rejected under 35 U.S.C.

103(a) as being unpatentable over Chapoulaud et al. (U.S. 2002/0028417) in view of Fujita et al.

(U.S. 5,712,965).

4.   Per claims 1-4, 39-43, 75-77, 83-84 Chapoulaud teaches a method, system, and non-

transitory computer readable medium for displaying, via a user interface of a computing device,

a three-dimensional (3D) digital representation of a tooth of a dental arch within a 3D

environment and displaying a 3D representation of an orthodontic appliance in the 3D

environment (see e.g., figures 5E and 5F). Additionally, Chapoulaud teaches allowing the

practitioner to move the orthodontic appliance relative to the 3D representation of the tooth with

in the 3D environment (paragraph 0091). The Examiner notes, Chapoulaud fails to explicitly

teach displaying via the user interface a two-dimensional planar guide with the 3D environment

as a visual aid to the practitioner in the placement of the appliance or as the user moves the

orthodontic appliance rendering the planar guide at a location that is based on a position of the

appliance. However, figures 16, 17A to 17C, and 18A to 18C of Fujita teach the use of planar

guides (i.e., each face of the circumscribed rectangular parallelepiped) to aid in the positioning of

solid 3D object within a 3D environment where the planar guides are rendered at a location that

is based on a position of the 3D object within the 3D environment (see column 5, lines 63 to

column 6, lines 59 and column 17, lines 3 to column 18, line 33).

5.   Therefore, it would have been obvious to one having ordinary skill in the art to modify

the method, system, and medium of Chapoulaud by using the method of manipulating 3D objects

as taught by Fujita to manipulate the orthodontic appliance of Chapoulaud in order to improve

operability as taught by Fujita (column 6, lines 27-36).

6.   Per claims 5-6, 44-45, and 78 the Examiner notes, Chapoulaud fails to explicitly teach a

mesial planar guide and a distal planar guide as claimed. However, the incorporation of the

circumscribed parallelepiped of Fujita in to the environment of Chapoulaud would result in both

mesial planar guides and distal planar guides. Specifically, it is clear from Fujita that the faces

of the circumscribed parallelepiped represent the extents of the object in three orthogonal axes.

As such, a parallelepiped circumscribed around a dental appliance would provide mesial and

distal planar guides as claimed. Similarly with respect to claims 7-11, and 46-50, the six faces of

the parallelepiped of Fujita which circumscribe a dental appliance of Chapoulaud would include

an occlusal planar guides or midlateral (i.e., the top face of the parallelepiped), a midfrontal

plane (i.e., the front face of the parallelepiped), a midsagittal planar guide (i.e., the left or right

face of the parallelepiped) and a gingival planar guide (i.e., the bottom face of the

parallelepiped). With respect to claim 13 and 51, the planar guides of Fujita include at least two

lines (see figure 17A to 17C and 18A to 18C). Per claims 87 and 88, figure 28B of Fujita

teaches displaying a planar guide that does not contact the object and displaying a planar guide at

a distance form the object. Per claim 89 Fujita teaches displaying a second planar guide by

rendering the second planar guide at a second location that is based on at least one of a position

or the orientation of the orthodontic appliance within the 3D environment, wherein a distance

between the first and second planar guides within the environment is adjustable (see figures 20A-

20C where in the scaling process the distance between opposite faces of the circumscribed

parallelepiped is adjustable, see column 18, line 34 to column 19, line 32).

7.   With respect to claim 14 and 15, the Examiner notes, Chapoulaud teaches displaying

teeth in different colors (paragraph 0084) but fails to teach displaying the planar guides as

different colors. However, it would have been obvious to one having ordinary skill in the art at

the time the invention was made to modify the method of Chapoulaud and Fujita to include

displaying the planar guides as different colors based on input from a user, in order to more

easily differentiate the different planar guides

8.   With respect to claim 18 and 19, Chapoulaud teaches storing data describing attributes

for the types of appliances that may be selected (i.e., bracket design data, paragraph 0062, 0094),

but fails to explicitly teach that the planar guides are displayed based on the stored data.

However, the planar guides of Fujita are arranged so as to circumscribe the 3D object. As such,

the displaying of the planar guides would be based off of at least the dimension of the

orthodontic appliance and thus meets the limitations as claimed.

9.   Per claims 21-24 and 53-60, the Examiner notes neither Chapoulaud nor Fujita explicitly

teach storing in a database planar guide data within the computing device, storing different types

of planar guides for different types of appliances or teeth. However, it is clear from the

disclosure of Fujita information regarding the planar guides is readily accessible upon the

selection of a specific 3D object within the environment (i.e., column 17, lines 12-22, teaches selectively displaying planar guides based upon which solid is select by the user). Additionally, the use of a database as a storage means and a network are well known in the art. As such, the Examiner submits storing information with respect to the planar guides would be an inherent step in the method of Fujita since the planar guides are displayed immediately upon the identification of the solid. Furthermore, one having ordinary skill in the art would recognize that each planar guides for each of the orthodontic appliances of Chapoulaud to be manipulated by the method of Fujita would have attributes stored relating to the planar guides for that particular appliance. Similarly, each planar guide for each appliance for each tooth would have different attributes (e.g., their positions in the global coordinate system). Also per claim 25-28 and 61-64, the planar guides of Fujita would have stored attributes specifying shear angle (i.e., angle of rotation, column 18, lines 12-14) and scales (i.e., magnifications, column 19, lines 12-16) and automatically scaling the planar guides (i.e., column 19, lines 26-31) and automatically shearing (i.e., rotating) the planar guides (column 18, lines 27-33).

10.   Per claims 31-32 and 67-68, the Examiner notes, Chapoulaud and Fujita fail to explicitly teach storing statistical normal distances for the dimensions of the teeth. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to store and utilize statistically normal teeth sizes in order to allow the device to minimize the amount of information that must be manual entered into the system. The Examiner notes, Chapoulaud discloses manufacturing orthodontic appliances. As such, an actual physical dimension would be necessary to ensure the manufactured appliances are of adequate size to perform their intended task.

11.   Per claims 33-36 and 69-43, the Examiner notes, Chapoulaud fails to teach displaying

visual markers relative to the planar guides at discrete intervals. However, Fujita teaches

displaying visual markers on a rectilinear grid of semi-transparent lines or tick marks (column

11, lines 23-32, and figures 6A to 6K). Per claim 38 and 74, Chapoulaud teaches the appliance is

a bracket.

12.   **Claims 12, 15, 16, 20-21 and 56 are rejected under 35 U.S.C. 103(a) as being**

unpatentable over Chapoulaud et al. (U.S. 2002/0028417) in view of Fujita et al. (U.S.

5,712,965) and further in view of Seidl (U.S. 5,583,977).

13.   Per claims 12, 15, 16 and 21, the Examiner notes, Chapoulaud and Fujita fail to explicitly

teach adjusting the transparency of the planar guides based on input from a user. However, Seidl

teaches planar guides (i.e., faces of bounding box, 398) with levels of transparency ranging from

invisible (i.e., wireframe), opaque, and transparent (column 7, lines 27-44). Therefore, it would

have been obvious to one having ordinary skill in the art at the time the invention was made to

modify the method of Chapoulaud and Fujita to include selectively adjusting the transparency of

the planar guides as taught by Seidl, in order to allow the user to view or not view the appliance

inside the planar guides during a positioning step. Additionally, with respect to claims 20 and

56, the Examiner notes, that levels of transparency disclosed by Seidl could be construed as

different types of planar guides (i.e., wireframe is one type and opaque is another).

14.   **Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chapoulaud**

et al. (U.S. 2002/0028417) in view of Fujita et al. (U.S. 5,712,965) and further in view of

Weichmann et al. (U.S. 2003/0152884).

15.   The Examiner notes, Chapoulaud and Fujita fail to explicitly teach the planar guides are automatically scaled to size the planar guide based on a dimension of the tooth. However, Weichmann teaches orthodontic brackets with pads that are sized based on the dimensions of the teeth (paragraphs 0086-0087). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method disclosed by Chapoulaud and Fujita to include sizing the orthodontic appliance according to a dimension of the tooth as taught by Weichmann in order allow for reliable positioning of the appliance on the tooth. The Examiner notes, if the appliance is sized based on the dimensions of the tooth then the size of the circumscribing parallelepiped of Fujita will be based on the size of the tooth.

16.   Claims 29-30, 65-66, and 79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chapoulaud et al. (U.S. 2002/0028417) in view of Fujita et al. (U.S. 5,712,965) and further in view of Kopelman et al. (U.S. 2003/014509).

17.   Per claims 29-30 and 65-67 and 79, Chapoulaud and Fujita disclose a method and system that shows the limitations as described above; but fails to teach data of rules for orthodontic appliance. Kopelman et al. teach a method and system comprising data 110 of rules for applying the orthodontic appliance. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method and system to comprise data of rules in order to obtain a desired outcome of positioning and orientation in view of Kopelman et al.

Allowable Subject Matter

18.   Claims 37, 80-82 and 85-86 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

19.   Applicant's arguments filed 20 July 2011 with respect to the independent claims 1, 4, 39,

and 74 have been fully considered but they are not persuasive.

20.   Beginning on page 20 of the remarks Applicant argues the combination of Chapoulaud

and Fujita fail to teach the method of claim 1. Applicant's argument seemingly hinges on the

Examiner's interpretation of the limitation "as the practitioner moves the orthodontic appliance

relative to the tooth within the 3D environment, rendering the planar guide at a location that is

based on at least one of a position or an orientation of the orthodontic appliance within the 3D

environment." Applicant as argued "an 'intended' final position of the object (i.e., a position not

yet achieved by that object) cannot reasonably characterized as the position or orientation of that

object within the 3D while moving in the 3D environment since the object is not in the 'intended'

position until after the object is actually moved within the 3D environment." The Examiner

respectfully disagrees. The Examiner notes, the claims as currently presented do not require "the

position or orientation of the orthodontic appliance within the 3D environment" to be a current or

previous position of the appliance. Additionally, it is the Examiner's position that the final

intended position of the object is within the 3D environment once achieved and thus the method

of Fujita meets the limitation of claim 1 as currently presented.

21.   Applicant has also argued "claim 1 does not require rendering a planar guide at a location

that is based on an intended position of an orthodontic appliance in the future once moved by the

user, but, rather, specifies that the planar guide is rendered at a location that is based on at least

one of a position or an orientation of the orthodontic appliance within the 3D environment."

First, the Examiner notes the "moving" of the object in Fujita does not happen in a single step.

Specifically, figures 17A-C of Fujita illustrates the entire move process as applied to a rotation of

a solid object. In figure 17A Fujita discloses "first, a cursor interlocked with a mouse is

positioned at a side of a frame of a circumscribed rectangular parallelepiped displayed. A button

of the mouse is then pressed." (Column 17, lines 56-59). In figure 17B Fujita shows the second

step of the moving function where "the rectangular parallelepiped is rotated with a center axis of

the solid parallel to the specified side as a rotation axis" (column 18, lines 16-18). The third and

final step of the move process is illustrated in figure 17C where Fujita teaches "after the mouse is

moved, when the button is released . . . the solid display means 26 displays the solid" (column

18, lines 27-32). It is the Examiner's position that this entire process collectively (i.e., the steps

shown in figure 17A-C) is the process by which the solid object is moved within a 3D

environment. The Examiner submits, that because at the beginning and at the end of the move

process the circumscribe parallelepiped of Fujita is rendered at a location that is based on the

initial and final intended positions of the object within the 3D environment, Fujita renders

obvious the limitation of claim 1 in question. Applicant further argues "in Fujita, the practitioner

does not move the solid object, but rather, moves the parallelepiped, Fujita fails to disclose that

the parallelepiped is rendered at a location as a practitioner moves the solid object within a 3D

environment. The Examiner respectfully disagrees and notes, as discussed above, it is the

Examiner's position that the movement of the parallelepiped is a sub-step in the overall move-

process disclosed by Fujita. As such, Fujita discloses rendering planar guides "as the practitioner

moves the orthodontic appliance". On page 22, Applicant argues "in Fujita it is the solid object

that is subsequently rendered based on the movement or rotation of the parallelepiped." Again

the Examiner notes, that the movement of the parallelepiped is a sub-step in the overall process

of moving the solid object as disclosed by Fujita and claims do not preclude the Examiner's

interpretation that the intended final position of the object meets the "position" as claimed.

22.   Applicant's arguments see pages 23-24 of the remarks, filed 20 July 2011, with respect to

the 103(a) rejection of claims 80-82, 85, and 86 have been fully considered and are persuasive.

The rejection of 20 April 2011 has been withdrawn.

Conclusion

23.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to **MICHAEL BALLINGER** whose telephone number is

(571)270-5567. The examiner can normally be reached on Monday thru Friday from 9 AM to

5:30 PM.

24.   If attempts to reach the examiner by telephone are unsuccessful, *please contact* **the**

examiner's supervisor, Mr. Todd Manahan, *at* **(571) 272-4713**. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

25.   *If there are any inquiries that are not being addressed by first contacting the Examiner*

or the Supervisor, you may send an email inquiry to

TC3700_Workgroup_D_Inquiries@uspto.gov.

26.   Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MICHAEL R BALLINGER/

Examiner, Art Unit 3776

/TODD E. MANAHAN/

Supervisory Patent Examiner, Art Unit 3776